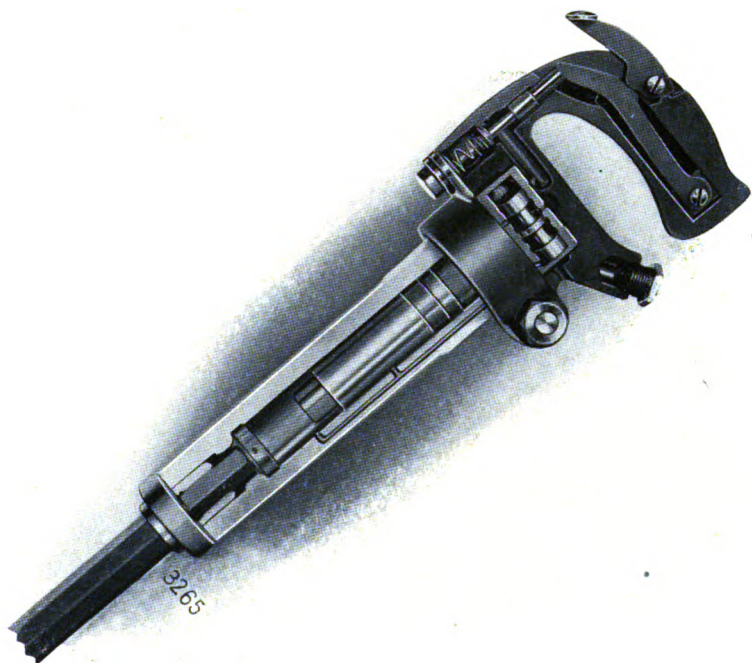


# Ingersoll-Rand Co.

## PNEUMATIC TOOL DEPARTMENT



### **“CROWN”**

### **Pneumatic Hammers**

Bulletin No. 2010  
**Labor-Saving Tools**  
Operated by Compressed Air

# Ingersoll-Rand Company

## PNEUMATIC TOOL DEPARTMENT

CHAS. H. HAESELER, Manager

11 BROADWAY, NEW YORK

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(4th and 5th Editions) Codes used.

# "CROWN" HAMMERS

## GUARANTEES

**T**HE Ingersoll-Rand Company furnishes its "Crown" hammers under a standing absolute guarantee of interchangeability of parts.

The Ingersoll-Rand Company furthermore guarantees that such is the care exercised in the selection of materials, in the workmanship applied, and in the methods of production, that "Crown" hammers, under fair treatment and reasonable freedom from abuse, will give better results, with the minimum of delay and expense for repairs, for a longer period than those of any other manufacturer.

## PATENTS

"Crown" Hammers are broadly covered by the following letters patent of the United States, and also by patents in foreign countries:

724,736 — April 7th, 1903

768,898 — August 30th, 1904

851,624 — April 23rd, 1907

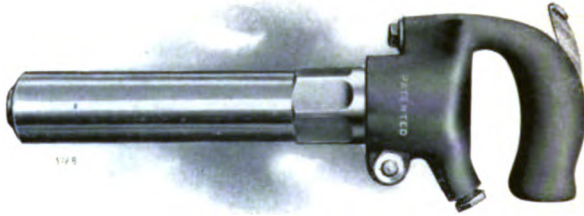
## AN EXTRACT FROM THE PATENT CLAIMS

"The combination with a cylinder and a piston, of a valve having pressure-receiving surfaces to move it in opposite directions, means for intermittently applying pressure to one of such surfaces, and means for constantly applying a lower pressure to the other of such surfaces."

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# **"CROWN" HAMMERS**

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## **THE "CROWN" CHIPPING HAMMER**

Made in five sizes suitable for all classes of chipping, calking, scaling and flue-beading. The larger sizes may be used for driving rivets of  $\frac{1}{2}$  inch diameter or smaller. Dimensions and weights are given on page 13.



## **THE "CROWN" RIVETING HAMMER**

Made in four sizes suitable for driving rivets of  $\frac{5}{8}$  inch to  $1\frac{1}{2}$  inch in diameter. Dimensions and weights are given on page 13.

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# "CROWN" HAMMERS

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## EXCLUSIVE FEATURES

**A New Design** — carrying with it unique advantages without departing from the standard and approved method of operation.

**The Valve** — a plain spool of hardened steel of one diameter, reversible, "fool-proof," and of the type approved in standard rock drill practise.

**The Valve Box** — a single piece of hardened and ground steel, with nothing to jar loose, shift or lose adjustment.

**The Valve Movement** — produced by unbalanced pressures on a valve of uniform diameter — a feature covered by a basic-patent.

**Cylinder and Piston** — of hardened and ground steel — an exclusive feature resulting in the elimination of wear with consequent leakage and loss of power.

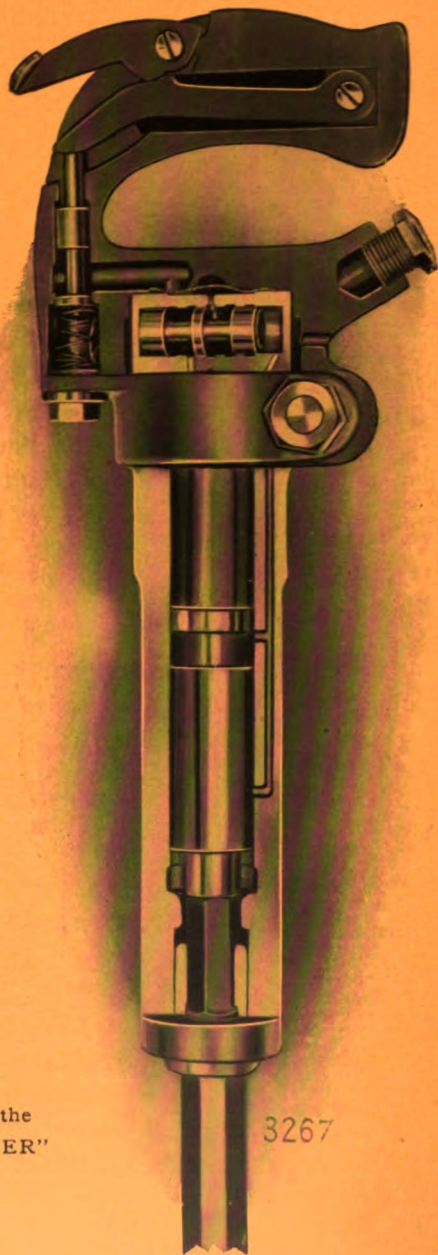
**Blow** — harder, sharper, and more rapid than that of any other hammer.

**Capacity** — greater than that of any other hammer of the same piston diameter and stroke, owing to the low friction of the moving parts.

**Air Consumption** — sustained over extended periods of operation, 20 to 30 percent less than that of any other hammer.

**Repair Costs** — lower than that of any other tool, owing to the simplicity of the design and to the hardening of all wearing parts.

# "CROWN" HAMMERS



Sectional View of the  
"CROWN HAMMER"

3267

# "CROWN" HAMMERS



## CONSTRUCTION

### THE VALVE

The valve is a plain spool shape, turned from selected steel, hardened and accurately ground to a uniform diameter. It is of the simplest and strongest form, identical in type with the spool valve used for years with such success in the most arduous conditions of rock drill service. Where the diameter is reduced to provide air passages, the reduction is secured by wide fillets which leave no opportunity for weak cross section or shrinkage flaws. It is extremely light, weighing less than an ounce, and in operation the vibration due to its movement is not perceptible. The simplicity of design and excellence of material sustain the Ingersoll-Rand guarantee against breakage in service of any "Crown" valve.



### THE VALVE BOX

The valve box is a solid piece of hardened and ground steel of selected quality, bored transversely with a hole of uniform diameter, in which the valve travels.

The air ports are simply drilled holes of ample diameter and of the least possible length. After the valve has been inserted in the valve box, the valve box sleeve, which is a ring of steel, is forced over the box and registered in position with a



dowel pin, which prevents any possible shifting and consequent interference with port openings. The features to be noted in this connection are: First, the hardened valve travels in a hardened valve seat. There is practically no wear, and the action of the valve is unusually lively, owing to the fact that the friction between valve and seat is only the slight friction between two hardened



# "CROWN" HAMMERS



surfaces. Second, it is utterly impossible for any part of the valve box to jar loose, shift or lose adjustment. Third, with the valve in place, and the sleeve



3283-C

3277-C

Valve Box Sleeve and Dowel Pin

forced over the box, a safeguard is provided against the valve being tampered with. Should the action of the valve become faulty, the difficulty can be instantly corrected by substituting another valve box, when the original working conditions are restored.

## THE VALVE MOVEMENT

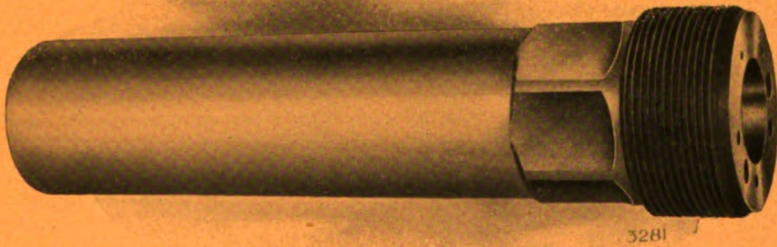
The action of the valve in the "Crown" hammer is not to be confused with that of other hammers in which the movement is produced by equal pressures on differential areas. The construction in the latter case involves the use of a valve of two diameters; and it is commercially impossible to produce such accurate workmanship on such a valve, and on the seat which such a valve requires, that leakage is entirely avoided. In the "Crown" hammer the valve and seat are of uniform diameter and the process of grinding is one which produces absolute accuracy and a plug tight working fit is maintained indefinitely, owing to the fact that both surfaces are hardened. The movement of the valve is produced by unbalanced pressures on its two ends. On one end a pressure lower than the full working pressure is constantly maintained; on the other end the full working pressure is intermittently applied. This is the distinctive feature of the "Crown" hammer which is covered by basic patents. It results in the utilization of the simplest, strongest and most efficient form of valve movement which is recognized as correct in pneumatic hammer design.



# "CROWN" HAMMERS

## THE CYLINDER

Another exclusive feature of the "Crown" hammer is the use of a cylinder with a hardened and ground bore. The material used is a steel of superior quality: and by a special process the interior or bore is hardened and ground, while the outside is left soft and tough.



The hexagon section next to the handle provides a means for holding the hammer in a vise when taking apart for cleaning or adjustment. Another distinctive feature of this cylinder construction is the fact that ports are drilled from the inside of the bore. There are thus no plugged openings giving an opportunity for plugs to work loose, and leaving recesses in the cylinder bore to accumulate grit and score the surface of the piston. The cylinder bushing is accurately machined to receive the chisel shank or rivet set, and is forced into the front end of the cylinder.



Cylinder Bushing

## THE PISTON

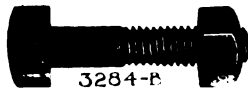
The piston is a hardened and ground piece of selected steel of a shape proved by the widest experience to give the greatest durability and strength.



# “CROWN” HAMMERS

## THE HANDLE

The handle is of drop forged steel, colored by a special process instead of enameled. It screws over the cylinder and is secured by a locking bolt and lock nut which absolutely prevents any shifting. Ports in the handle are bored, and are of unusually ample area, and are short as possible. The valve box sits in a recess in the handle and is clamped between handle and cylinder as the latter is screwed in place.



Handle, Nipple and Bolt



3285-D



3285-E

Dowel Pins for holding the Levers

## THE THROTTLE AND ACCESSORIES

The controlling mechanism of the “Crown” hammer is made up of the usual throttle lever, piston valve, springs, etc. The use of this arrangement insures short, free ports, extreme simplicity and great endurance in service.



3285-F



3285-G



3285-K



3285-J

The Throttle Levers



3285-H

Piston Valve, Plug and Spring



# "CROWN" HAMMERS

## THE SCREEN

A unique feature of the "Crown" hammer is the use of a screen of usually large diameter. This is shown in its relative position to the other parts in the illustration on page 6. It is circular in shape and is inserted in a recess in the handle next to the valve box. It is thus entirely out of sight and out of reach of the operator who cannot remove it or injure it without entirely dismantling the hammer. Being of unusually large diameter it is much less likely to become clogged up



3283-B

with dirt, thus cutting down the air supply to the hammer. When it does become filled with dirt, it can easily be removed and cleaned by blowing a jet of air through it in the opposite direction from that in which the air usually passes through it.



3283-A

Hose Nipple

## THE AIR CONSUMPTION

The only true measure of air economy of a pneumatic tool is its air consumption as sustained over long periods of operation. Measured by this standard the air consumption of the "Crown" hammer is from 20 to 30 per cent. less than that of any other pneumatic hammer on the market. Air economy in the "Crown" hammer is due to two features distinctive of this tool. First, the clearance spaces are less than ever hitherto found in pneumatic tool practice. While the ports and air passages are unusually ample in area, they have been shortened up; and the small diameter of the valve is itself an important element in bringing down this loss which has hitherto been so large in other designs. Second, leakage is eliminated by the use of hardened surfaces throughout the tool

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# **“CROWN”**



# **HAMMERS**

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where wear would naturally occur, not only the valve and piston, but also the valve seat and cylinder bore being hardened. Examination of “Crown” hammers after months of operation has shown an air-tight working fit on both piston and valve, proving that the element of wear and consequent leakage has been removed.

## **CAPACITY**

Exhaustive tests in actual service have shown that the “Crown” hammer has a larger capacity for work than any other hammer of the same size. This is due to the unmatched quality of the blow, which in turn is due to the elimination of friction, to the use of hardened surfaces and also to the direct air admission and exhaust ports which secure the full force of the air pressure on the piston from beginning to end of stroke, and the highest velocity of the striking piston.

## **REPAIR COST**

The “Crown” hammer is the simplest pneumatic hammer made and has the least number of parts. The design of parts usually most delicate in a tool of this kind, is such as to give maximum strength and resistance. Hardened and ground wearing surfaces, already several times referred to, are another element in increasing the durability of “Crown” hammers to a point which has hitherto not been realized in pneumatic tool practice.

## **INTERCHANGEABILITY**

Every part of “Crown” hammers is made to be absolutely interchangeable. Uniformity of dimension within the thousandth of an inch is maintained by the use of accurate limit gauges. Each part is carefully inspected as to quality and workmanship, and measured by this system of gauges. Uniformity of dimension and quality are thus assured and when a duplicate part is ordered it is absolutely certain to fit in place without any hand work or fitting.

## "CROWN" HAMMERS

FOR  
CHIPPING, CALKING, SCALING AND FLUE-BEADING

Telegraph Name	Style of Bushing	Size No.	Weight Pounds	Cubic Feet Free Air Per Minute		Piston Stroke Inches	Length Over All Inches	Size Hose Connections Pipe Thread Inches
				60 lb.	100 lb.			
Voragumflo...	Hexagon	55-H	13	14	24	5	15 $\frac{3}{4}$	$\frac{1}{4}$
Voragumido...	Hexagon	54-H	12	13	22	4	14 $\frac{3}{4}$	$\frac{1}{4}$
Voragumina...	Hexagon	53-H	11	12	20	3	13 $\frac{3}{4}$	$\frac{1}{4}$
Voragumior...	Hexagon	52-H	10	11	18	2	12 $\frac{3}{4}$	$\frac{1}{4}$
Voragumis...	Hexagon	51-H	9	10	17	1	11 $\frac{3}{4}$	$\frac{1}{4}$
Voragumo...	Round	55-H	13	14	24	5	15 $\frac{3}{4}$	$\frac{1}{4}$
Voragumoso...	Round	54-H	12	13	22	4	14 $\frac{3}{4}$	$\frac{1}{4}$
Voragumpam.	Round	53-H	11	12	20	3	13 $\frac{3}{4}$	$\frac{1}{4}$
Voragumpir...	Round	52-H	10	11	18	2	12 $\frac{3}{4}$	$\frac{1}{4}$
Voragun.....	Round	51-H	9	10	17	1	11 $\frac{3}{4}$	$\frac{1}{4}$

### SUITABLE FOR

55-H	Driving $\frac{1}{2}$ -inch diameter Hot Rivets. Extra Heavy Chipping and Calking.
54-H	Heavy Chipping and Calking. Riveting Light Tanks and Heavy Sheet Iron
53-H	General Chipping and Calking.
52-H	Light Chipping and Calking. Beading Flues and Scaling Castings.
51-H	Chipping and Calking Bath Tub and Range Boilers and other Light Work.

### ACCESSORIES FURNISHED

55-H	Three Rivet Sets or Three Chisels.
All Other Sizes	Three Round or Hexagon Chisels.

## "CROWN" HAMMERS LONG STROKE RIVETERS

Telegraph Name	Size No.	Weight Pounds	Cubic Feet Free Air Per Minute		Piston Stroke Inches	Length Over All Inches	Size Hose Connections Pipe Thread Inches
			60 lbs.	100 lbs			
Voragurgam...	73-H	22 $\frac{1}{2}$	27	50	10	22 $\frac{1}{4}$	$\frac{3}{8}$
Voragurian...	72-H	22	25	49	9	21 $\frac{1}{4}$	$\frac{3}{8}$
Voragurios...	71-H	21	24	45	8	20 $\frac{1}{4}$	$\frac{3}{8}$
Voraguriza...	70-H	19	22	42	6	18 $\frac{1}{4}$	$\frac{3}{8}$

### SUITABLE FOR

73-H	Driving Rivets— $1\frac{1}{8}$ -inch diameter and less
72-H	Driving Rivets— $1\frac{1}{4}$ -inch diameter and less
71-H	Driving Rivets—1 inch diameter and less
70-H	Driving Rivets— $\frac{3}{4}$ -inch diameter and less

### ACCESSORIES FURNISHED

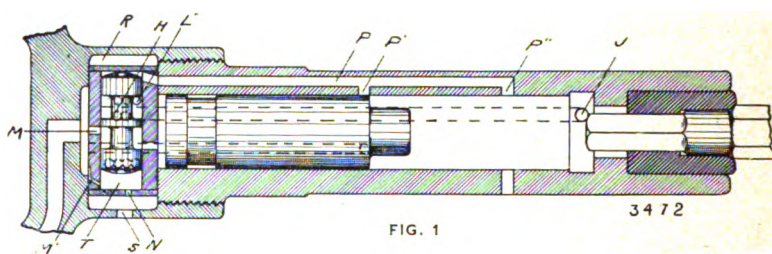
All Sizes	Three Rivet Sets.
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# "CROWN" HAMMERS

## THE OPERATION

The operation of the "Crown" hammer will be understood by reference to the accompanying sectional diagram.

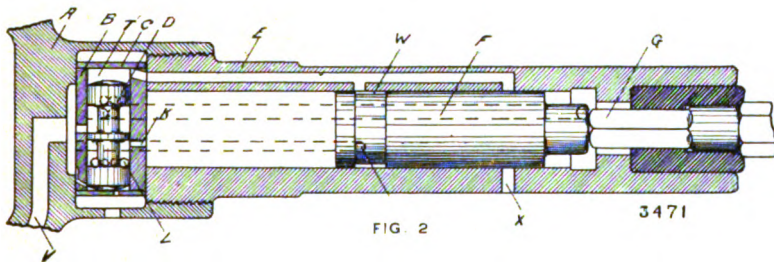


The ports being in the position shown in Fig. 1, air entering through the port V in the handle, passes through the ports M and M' into the valve box. Part of the air which enters through the port M' escapes through port N, causing the air pressure in the chamber T in the valve box to be reduced below the working pressure in the hammer. This reduces pressure in the chamber T, holds the valve in the position shown, and allows the air entering the ports M to pass around the valve D, through the ports K into the cylinder, forcing the piston forward to the position shown in Fig. 2.

Air from the front end of the cylinder exhausts through the ports X and ports J, H, L' and the exhaust space R, during the forward stroke of the piston.

# “CROWN” HAMMERS

When the piston reaches the end of its stroke, it allows the live air to pass from the port Y around the groove W in the piston, and through the ports P and P' to the chamber T' in the valve box. This pressure being greater than the pressure in the chamber T forces the valve to the position shown in Fig. 2.



Air coming through the ports M now passes through the ports H and J to the front end of cylinder, forcing the piston backward to the position shown in Fig. 1. During this backward travel the pressure in the rear end of the cylinder is exhausted through the ports K and L and the exhaust space R.

When the piston in its backward travel uncovers the port P" and port X, it allows all the pressure in the port P and the front end of the cylinder to escape. This removes the pressure from the chamber T' in the valve box, causing the valve to resume the position shown in Fig. 1, due to the action of the constant pressure in the chamber T.

The ports are now in their original position, the cycle of operation is completed and ready for repetition on the next stroke.

## THE CARE OF “CROWN” HAMMERS

It is doubtful if any piece of machinery pays greater profit on its original cost than a pneumatic hammer if kept in good working condition. It is also doubtful if any piece of high speed, high grade machinery is so much abused by neglect as to its cleaning and oiling.

It is essential to the good working and durability of all pneumatic hammers that they be kept clean and well oiled. This should not be delayed until the tool stops working on account of dirt, rust or gummed oil. Clean thoroughly with kerosene or benzine before oiling, when ready to put the tool in operation. Do this by immersing the entire tool in kerosene, or better still, by keeping the tools immersed in kerosene when not in use.

All hammers should be oiled through the hose nipple on the end of the handle before being put in service. Only good, light-body oil should be used. Sewing-machine oil is good, but what is still better is “**Sprayoleum**,” an oil manufactured especially for the Ingersoll-Rand Company for use with pneumatic tools. Heavy oils should be avoided as they gum up and cause the tool to work sluggishly, with consequent loss of power.

**It will handsomely repay any user of pneumatic hammers to keep the inside of the tools as clean and well oiled as a sportsman does his gun.**

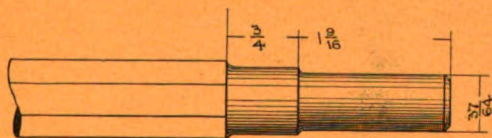
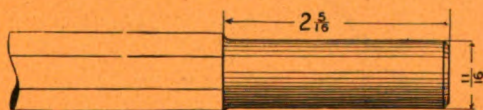
The construction of “Crown” hammers is such that none of the parts will break under service, and the tools will always work well and maintain their efficiency for an indefinite length of time, if they are kept clean and well oiled.

# “CROWN” HAMMERS

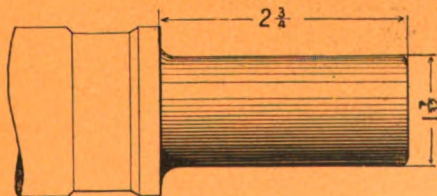
## CHISEL AND RIVET SET SHANKS

Each new hammer, when shipped, has three chisels or three rivet sets, depending on whether it is a chipping or riveting hammer.

The shanks on these blanks are made to fit snugly in the bushing in the end of the tool, and it is important that a reasonably close fit be maintained, as otherwise air leaks past the shank and



13



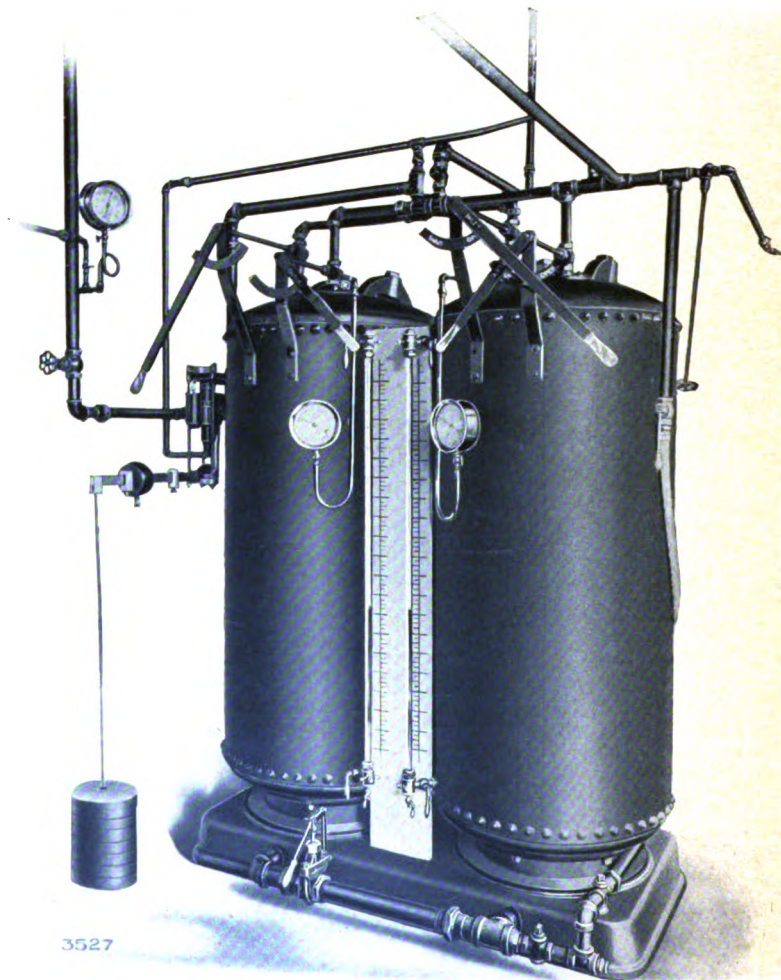
14

the tool will not work to best advantage. The shank dimensions given on the line drawings herewith, are standard, and should be used in re-forming old tools or making new ones.



# "CROWN" HAMMERS

## DISPLACEMENT AIR METER FOR MEASURING THE AIR CONSUMPTION OF PNEUMATIC TOOLS



During the past twelve years the Ingersoll-Rand Company has used large numbers of pneumatic tools of all types in its shops and foundries. Recognizing that the air consumption of such tools as sustained over an extended period of use is an important factor in securing the best results from them as cost-reducers, the Company has from time to time made exhaustive tests in order to secure the benefit of the best tools obtainable.



# "CROWN" HAMMERS

It is evident that the **sustained efficiency** of a tool depends upon the wear-resisting qualities of its moving parts. This wear affects not only the air consumption of the tool, but also its power and capacity. Excessive wear means heavy leakage, with waste of air and loss of power. Experience has demonstrated that most pneumatic tools, after being in service only a short time, suffer an increase in their air consumption with a falling off in their power due to the leakage arising from the wear of soft materials in valves, valve boxes, pistons and cylinders.

In order to prove just how much this loss of power amounts to, and to assist in guarding against it in its own line of pneumatic tools, the Ingersoll-Rand Company devised and installed in the testing room of its Pneumatic Tool Department the water displacement air meter illustrated on the opposite page. Without going into details, it will be enough to say that this device accurately measures the volume of air used by any tool in doing a certain amount of work, the air volume supplied to it displacing from one tank to another its exact equivalent volume of water. This is the only **positive** means of metering the air consumption of any tool.

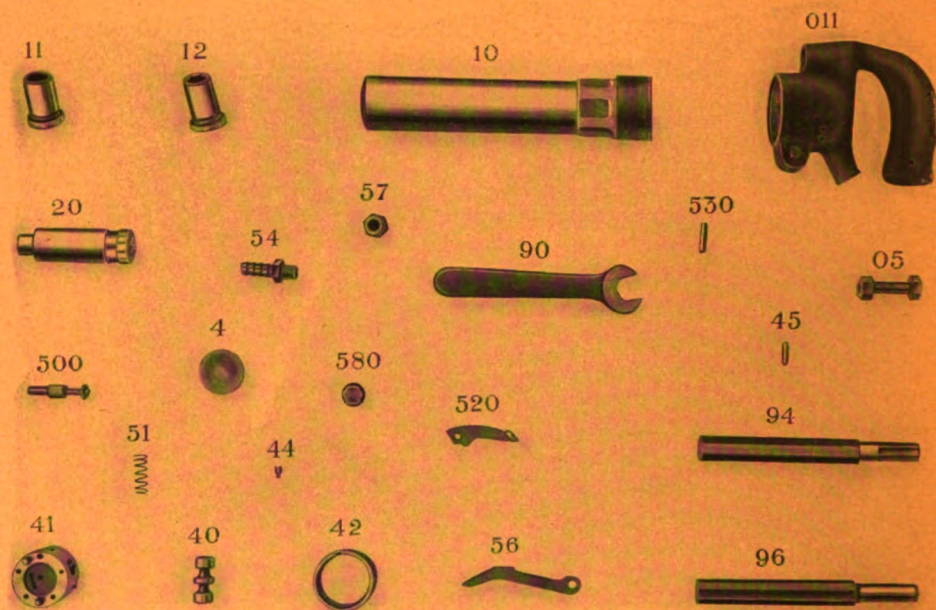
The figures on air consumption of "Crown" Hammers given on page 14 were found by means of this meter. They are therefore absolutely correct. The high air economy of these tools is due to the fact that valve, valve box, piston and cylinder are all made of selected steel **carefully hardened and ground**. Wear is thus practically eliminated and the air-tight fit of valve and piston—the only two moving parts—is maintained indefinitely. This is a refinement found in "Crown" Hammers exclusively and is the basis of the claim for these tools of **the highest sustained power and economy**.

The Ingersoll-Rand Company claims as a result of tests of its own and of other makes, new, worn and old, that its line of pneumatic tools are the most economical in net cost of work done, not as a matter alone of original performance, but for their lifetime, and this claim is backed up by practical results secured in its several large plants where air tools are used on an extensive scale.

# "CROWN" HAMMERS

## CHIPPING HAMMERS

Sizes: 51-H, 52-H, 53-H, 54-H and 55-H.



5135

## DUPLICATE PART LIST

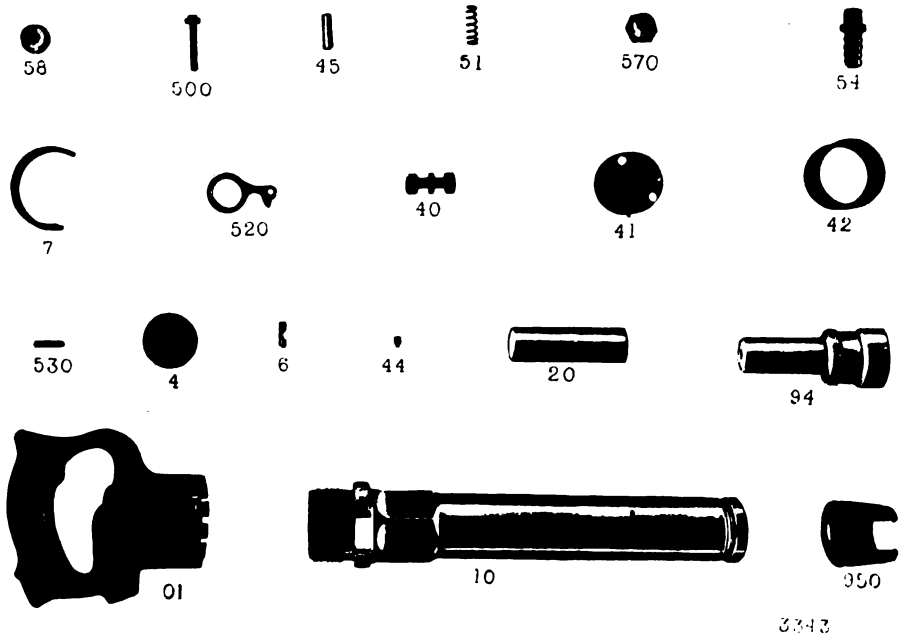
Telegraph Name	Symbol and Number of Part	Name of Part	Telegraph Name	Symbol and Number of Part	Name of Part
Voragundio ..	3H-011	Handle	Voraguptam ..	51H-44	Valve Box
Voragunes ...	3H-4	Strainer			Sleeve Dowel
Voragungis ..	3H-05	Handle Clamp Bolt	Voraguptio ..	51H-45	Valve Box
Voragunhem ..	51H-10	Cylinder			Dowel
Voragunho ...	52H-10	Cylinder	Voraguquem ..	3H-500	Throttle Valve
Voragunico ...	53H-10	Cylinder	Voragura ....	3H-51	Throttle Valve
Voragunta ...	54H-10	Cylinder			Spring
Voragunzia ...	55H-10	Cylinder	Voraguraca ..	3H-520	Throttle Lever
Voraguoco ...	51H-11	Cylinder Bushing, Round	Voragurano ..	9H-530	Throttle Lever
Voraguore ...	51H-12	Cylinder Bushing, Hexagon			Pin
Voraguosa ...	3H-20	Piston	Voraguraux ..	3H-54	Hose Nipple
Voragupalo ..	.....	Valve Box and Valve Complete, consisting of Parts 40, 41, 42, 44 and 45.	Voragurbem ..	3H-56	Lever
Voragupebo ..	51H-40	Valve	Voragurcas ..	3H-570	Nipple
Voragupera ..	51H-41	Valve Box	Voragurdir ..	3H-580	Screw Plug
Voraguphea ..	51H-42	Valve Box Sleeve	Voragurent ..	51H-90	Clamp Bolt
					Wrench
			Voragurero ..	3H-94	Chisel Blank, Hexagon
			Voragureur ..	3H-96	Chisel Blank, Round
			Voragurfal ..	3H-98	Chisel Blank, Differential

NOTE—Any part of any size Chipping Hammer is interchangeable with the like part of any other Chipping Hammer, excepting the Cylinder—Part No. 10.

# “CROWN” HAMMERS

## RIVETING HAMMERS

Sizes: 70-H, 71-H, 72-H and 73-H



## DUPLICATE PART LIST

Telegraph Name	Symbol and Number of Part	Name of Part	Telegraph Name	Symbol and Number of Part	Name of Part
Voragurreo ..	9H-01	Handle	Voragutoir ..	51H-44	Valve Box
Voragurror ..	3HD-4	Strainer			Sleeve Dowel
Voraguscar ..	3H-6	Key	Voraguteba ..	70H-45	Valve Box
Voragusino ..	9H-7	Key Spring			Dowel
Voragusite ..	70H-10	Cylinder	Voragutum ..	9H-500	Throttle Valve
Voragussas ..	71H-10	Cylinder	Voraguunt ..	3H-51	Throttle Valve
Voragussim ..	72H-10	Cylinder			Spring
Voragustez ..	73H-10	Cylinder	Voraguvela ..	70H-520	Throttle Trigger
Voragustro ..	9H-20	Piston	Voraguviem ..	9H-530	Throttle Valve
Voragutega ..	.....	Valve Box and Valve complete, consisting of Parts 40, 41, 42, 44 and 45	Voraguvion ..	9H-570	Trigger Pin
			Voraguxio ..	3H-58	Nipple
Voragutelo ..	70H-40	Valve	Voraguzafa ..	9H-94	Screw Plug
Voragutere ..	70H-41	Valve Box	Voraguzar ..	9H-94A	Rivet Set Blank
Voragutiam ..	70H-42	Valve Box			Rivet Set
		Sleeve	Voraguzza ..	9H-950	Finished
					Rivet Set Spring

NOTE—Any part of any size Riveting Hammer is interchangeable with the like part of any other Riveting Hammer, excepting the cylinder—Part No. 10.

# "CROWN" HAMMERS



Chipping a Cylinder with "Crown" Hammers.

# Ingersoll-Rand Publications

## Air Compressors.

- 36. Catalog—Ingersoll-Sergeant Air and Gas Compressors.
- R-37. Catalog—Rand Air and Gas Compressors.
- 35-D. Leaflet—Ingersoll-Rand Air Compressors.
- 340. Booklet—Blue Book of Air Compressors.
- X-36. Catalog—"Imperial" Type Ten Air Compressors.
- XI-36. Catalog—"Imperial" Type Eleven Air Compressors.
- H-36. Catalog—Class "H" Air Compressors.

## Rock Excavation.

- 46. Catalog—Rand Rock Drills and Mountings.
- 45-B. Catalog—Ingersoll-Sergeant Rock Drills.
- 45-A. Leaflet—Ingersoll-Rand Rock Drills.
- 60. Catalog—Stone Channeling Machines.
- 60-A. Leaflet—Quarry Machinery.
- 322. Pamphlet—The "Broncho" Channeler.
- 241. Booklet—Driving the New York Subway.
- 346. Pamphlet—The Central Air Plant.
- 2009. Bulletin—The "Little Imp" Hammer Drill.
- 2011. Bulletin—The "Little Jap" Hammer Drill.

## Core Drilling.

- 91. Catalog—The Davis Calyx Diamondless Drill.
- 91A. Leaflet— " " " " "

## Coal Mining.

- 52. Catalog—Coal Mining Machinery.
- 52-A. Leaflet—Coal Mining Machinery.
- 353. Pamphlet—The "Radialaxe" Coal Cutter.

## Air Lift.

- R-12. Catalog—Pumping by Compressed Air.
- 73. Catalog—Lifting Water by Compressed Air.
- 74-A. Booklet—Pneumatic Pumping.

## Pneumatic Tools.

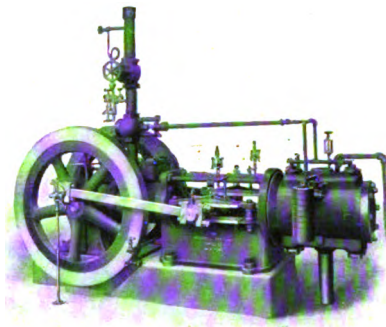
- 6. Catalog—Haeseler "Axial Valve" Air Hammers.
- 2004. Bulletin—Stone Working Tools.
- 2006. Bulletin—"Imperial" Pneumatic Hammers.
- 2007. Bulletin—"Imperial" Pneumatic Drills.
- 2008. Bulletin—"Imperial" Air Hoists and Stationary Motors.
- 6-A. Leaflet—Ingersoll-Rand Pneumatic Tools.



# Complete Air Installations

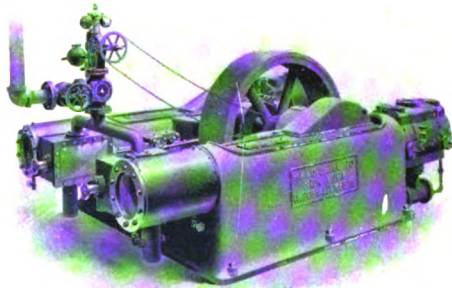


**Bench Sand Rammer**

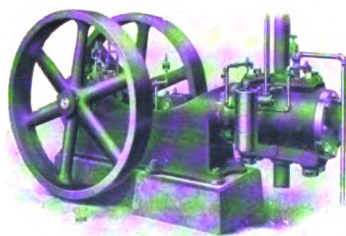


**A straight line steam driven Air Compressor of small or medium capacity. High efficiency with minimum attention**

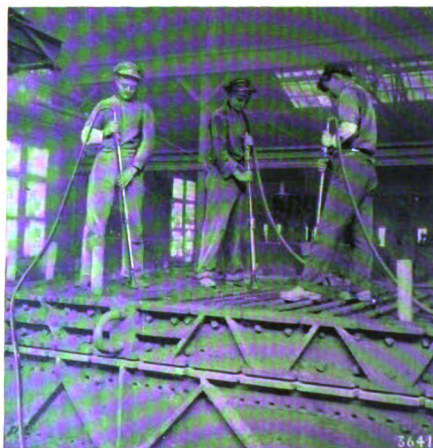
**One of the "Imperial" Type Ten Compressors**



**Steam or power driven. All pressures and all capacities**



**A straight line power driven Air Compressor of small or medium capacity. For shops and factories when surplus power is available**



**Floor Sand Rammer**